EPA Superfund
Explanation of Significant Differences

AMERICAN CHEMICAL SERVICE, INC.
EPA ID: IND016360265
GRIFFITH, IN
September 15, 2004

EXPLANATION OF SIGNIFICANT DIFFERENCES

American Chemical Service, Inc. Site

Griffith, IN

Brief summary: EPA is issuing an Explanation of Significant Differences (ESD) to the 1992 Record of Decision (ROD) and 1999 ROD Amendment for the American Chemical Service, Inc. site to denote a partial change in the method we will be using to clean up the groundwater contaminant plumes at the site. The 1992 ROD called for the use of groundwater pump-and-treat to clean up the on- and off-site groundwater contaminant plumes to selected cleanup levels. The 1999 ROD Amendment changed the on-site groundwater cleanup approach to a containment remedy rather than a restoration remedy. This ESD changes the off-site groundwater cleanup approach from solely pump-and-treat to a mixture of pump-and-treat, *in situ* chemical oxidation, and monitored natural attenuation.

Explanation of Significant Differences
American Chemical Service, Inc.

I. Introduction to the Site and Statement of Purpose

A. Site Name and Location

American Chemical Service, Inc.
Griffith, Indiana

B. Identification of Lead and Support Agencies

Lead Agency: U.S. Environmental Protection Agency (EPA)

Support Agency: Indiana Department of Environmental Management (IDEM)

C. Statement of Purpose

This decision document sets forth the basis for our decision to issue an Explanation of Significant Differences (ESD) to the 1992 Record of Decision (ROD) and the 1999 ROD Amendment for the American Chemical Service, Inc. (ACS) Superfund site, Griffith, IN.

D. Statutory Basis for Issuance of the ESD

Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[1] states that EPA shall publish an explanation of the significant differences between the remedial action being undertaken at a site and the remedial action set forth in the Record of Decision (ROD) if we determine that the remedial action at the site differs significantly from the ROD remedial action. We shall also publish the reasons such changes are being made. EPA policy and regulations[2] indicate that an ESD, rather than a ROD amendment, is appropriate where the changes being made to the remedial action are significant but do not fundamentally alter the overall remedy with respect to scope, performance, or cost.

E. Summary of Circumstances Necessitating this ESD

The ACS potentially responsible party (PRP) group proposed to EPA that we change the 1992 ROD groundwater cleanup remedy from a site-wide pump-and-treat method to a method that uses a combination of pump-and-treat, *in-situ* chemical oxidation, and modified natural attenuation (MNA) to address off-site groundwater contamination. The PRP group proposed that EPA change the off-site groundwater remedy because the

---

[1] 42 U.S.C. § 9617(c)

[2] See 40 CFR 300.435(c) (National Contingency Plan); EPA Office of Solid Waste and Emergency Response Directive 9355.3-02

original pump-and-treat remedy we selected may be technically impracticable in some areas.

The 1992 ROD selected groundwater pump-and-treat as a site-wide approach to clean up the contaminant plumes to selected cleanup levels. We selected the groundwater cleanup levels based on a residential future site-use assumption. Later, we changed the on-site future site-use assumption in the 1999 ROD Amendment after we determined that a commercial/industrial future site-use was more appropriate based on current site uses and zoning. We therefore amended the on-site groundwater cleanup approach to change it from a full pump-and-treat alternative to a containment remedy with some treatment.

EPA did not change the groundwater cleanup approach or the cleanup levels for the off-site contaminant plumes in the 1999 ROD Amendment. However, we did note that we had technical concerns about installing a full groundwater pump-and-treat cleanup method in these areas because the local aquifer characteristics could make the installation and operation of this type of groundwater remedy impracticable. Therefore, we needed to come up with other means to achieve the groundwater cleanup levels. After we tested several alternative approaches to groundwater cleanup at the ACS site, we decided to use a combination of pump-and-treat, *in-situ* chemical oxidation, and modified natural attenuation (MNA) to address off-site groundwater contamination.

The change in the groundwater remedy is discussed below in Section III.

F. Agency Determination

EPA, in consultation with IDEM, reviewed the ACS PRP group's proposed change to the ACS site groundwater remedial action in accordance with CERCLA and EPA policy and guidance. We have determined that their proposed change to the ROD groundwater remedial action, as amended, is significant but does not fundamentally alter the overall site remedial action with respect to scope, performance, or cost. Thus, EPA finds that it is appropriate that we issue an ESD to document the change.

G. Administrative Record

In accordance with Section 300.435(c) of the National Contingency Plan, this ESD and supporting documentation will become part of the Administrative Record for the ACS site. The Administrative Record is available for public review at the following locations:

Records Center
EPA Region 5
77 W. Jackson Blvd. - 7th Floor
Chicago, IL 60604
(8 am-4 pm M-F)

Griffith Public Library
940 N. Broad St.
Griffith, IN 46319-1528
(10 am-8:30 pm M-Th;
10 am-6 pm F; 9 am-5 pm Sat.)

Griffith Township Hall
111 N. Broad St.
Griffith, IN 46319
(8:30 am-4:30 pm M-F)

II. Site History, Contaminants, and Selected Remedy

A. Location and Site History

The ACS site is located at 420 S. Colfax Ave., Griffith, Indiana (see Figure 1) and is comprised of 19 acres of American Chemical Service Inc.-owned or leased property which includes the so-called "Off-Site Containment" and the "On-Site Containment" areas, the 2-acre property known as the "Kapica-Pazmey" property, and, formerly, a 15-acre portion of the Griffith Municipal Landfill. A vast amount of chemical wastes were deposited on site and there are two groundwater contaminant plumes emanating from the ACS site. Site contaminants have also impacted a nearby wetland area.

American Chemical Service, Inc. began a solvent recovery business on the site property in May 1955. Its past waste handling, storage, and disposal practices led to the contamination of the site (except for the Town of Griffith Landfill[3] area and the Kapica-Pazmey[4] area), to the extent described in the 1992 ROD and related site documents. ACS ceased its solvent reclaiming activities upon losing its interim status (authorization to operate) under the Resource Conservation and Recovery Act (RCRA) in 1990, although it continues its specialty chemical manufacturing or blending operations to this day.

NPL Listing

EPA (Region 5) completed a Hazard Ranking System scoring package and nominated the ACS site for inclusion on the National Priorities List (NPL) in December 1982. NPL final rule listing of the site occurred on September 8, 1983 upon publication in the Federal Register (FR) (48 FR 40658). The effective date of NPL listing was 30 days following FR publication.

Remedial Investigation (RI)

The ACS site has been extensively studied and tested to determine the nature and extent of chemical contamination in and around the site. The RI report showed that

---

[3]The Town of Griffith is addressing the 15-acre portion of the Griffith Municipal Landfill through the Indiana State Solid Waste closure/post-closure program.

[4]The Kapica-Pazmey area was the site of a chemical waste drum reconditioning company that was not associated with ACS, Inc. but it may have received materials from ACS, Inc. and others.

there are large areas on site with numerous types of buried contaminants that are both sources of groundwater contamination and potential contact hazards for site workers. Major waste categories include volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and heavy metals. These contaminants are found at variable concentrations in the ground within the Off-site Containment area, the Kapica-Pazmey area, and in the On-site Containment area. Several VOCs, such as benzene and chloroethane, are a concern in area groundwater.

1992 ROD

EPA, with IDEM's concurrence, selected a cleanup approach in the 1992 ROD which used thermal and other treatment methods to clean up or restore the contaminated property. We selected site cleanup levels to allow for the future unrestricted use of the property with unlimited exposure to residual contaminants (residential use). We contemplated the use of groundwater-use restrictions for areas beyond ACS, Inc. property boundaries until the groundwater quality in these areas was restored to drinkable status. We also sought to restrict the future use of groundwater directly under the site. (See Table 1 for a display of the components of the selected remedial action for the ACS site.)

EPA estimated in the 1992 ROD that the selected cleanup remedy would cost between $38 million and $47 million to construct and implement over a 6-year to 8-year time frame.

Post-ROD Studies

EPA conducted site-waste materials handling and treatability studies in preparation for the site cleanup to determine if the selected remedy was viable for the ACS site. The results of the studies and testing indicated that a much greater volume of contaminated waste, soils, and debris would have had to be excavated and treated to remove VOCs in order to meet residential cleanup levels. We also found that the VOC contaminant-mass was greatly underestimated. The study results projected the need for an extra high level of safety requirements for site workers due to the very high levels of VOCs that would be encountered when contaminated soil, waste, and debris were excavated for treatment. The high levels of VOCs could constitute an explosive hazard as well as an exposure hazard to site cleanup workers and plausibly to area residents. Moreover, much of the soil, debris, and waste materials could not be treated effectively using the selected treatment method. The reports entitled "Pretreatment/Materials Handling Study Report" (1997) and "Thermal Treatability Study" (1998) that were prepared by the ACS site PRP group contain the results of these testing efforts.

Based on a new volume estimate of 150,000 to 200,000 cubic yards of impacted soil and debris, we estimated that the 1992 ROD cleanup remedy could cost $150-245 million or more to construct and safely implement. We therefore concluded that other waste management or cleanup options were necessary for the ACS site.

1999 ROD Amendment

EPA issued a proposed plan for public comment and then amended the 1992 ROD cleanup remedy in 1999. We changed the 1992 ROD cleanup remedy due to the potential health and safety concerns with performing the selected remedy, cost effectiveness, and because we considered the request from the ACS site PRP group that we use a future industrial site-use assumption[5] in making an amended cleanup decision.

EPA selected a new cleanup approach that would result in site wastes being contained in place and/or treated by using a combination of some of the cleanup alternatives we previously evaluated in the 1992 ROD. One part of the new cleanup remedy called for the construction of a subsurface barrier wall ("slurry wall") around the ACS site to minimize the movement of site contaminants off site and to impede groundwater flow into the site. Groundwater would be pumped out from within the area of the barrier wall to create an inward gradient and then it would treated. (See Table 1 for a display of the components of the amended remedial action for the ACS site.)

EPA also decided to place institutional controls such as deed notices and site-use restrictions on the ACS site. The site-use restrictions would ensure that the future use of the property will be restricted to those activities which do not interfere with the performance of any of the cleanup activities. The deed notice would serve to warn future site owners that should a zoning change be made, such a change must be accompanied by a proper cleanup effort needed for the new site-use assumption. (See Appendix 1 for a discussion of institutional controls at the site.)

The 1999 ROD Amendment did not change the 1992 ROD groundwater pump-and-treat approach for cleanup of the contaminant plumes outside the barrier wall to reach groundwater cleanup levels. We did propose to test *in situ* groundwater treatment methods and a monitored natural attenuation[6] (MNA) approach in lieu of the pump-and-treat method to see if these methods could be successful in restoring groundwater quality. For example, should natural dilution, sorption, and biodegradation forces cause water quality to be able improve in a reasonable time frame versus active treatment methods, then MNA can be considered to be a viable cleanup alternative for groundwater.

Our estimated cost for completing the amended cleanup remedy ranged from $45 million to $50 million. This cost estimate includes an $18 million capital cost plus $27

---

[5]The current zoning designation assigned by the Town of Griffith is industrial use.

[6]Natural attenuation is the general process of monitoring water quality over a period of time to demonstrate that natural processes are causing contaminant levels to fall due to a combination of dilution, biodegradation, and sorption forces within the groundwater aquifer.

million (present net worth at the 5% discount rate then in effect) in operation and maintenance (O&M) costs over a 30-year time frame.

III. Basis for the ESD

EPA selected groundwater pump-and-treat in the 1992 ROD as the site groundwater restoration method. As seen in Figure 1, groundwater contaminant plumes, defined as those areas at which the groundwater exceeds contaminant cleanup levels, are present in the northern and southern areas of the site. We later found that aquifer characteristics are such that it may be impracticable to implement a plume-wide groundwater pump-and-treat program to restore groundwater quality. Pumping usually only recovered about 1 gallon per minute (gpm) from the aquifer; thus, we estimated that we would need to place many pumping wells into the apparent contaminant plume area to effectively clean up the groundwater. We decided that this was not practicable from a logistical standpoint. Thus, from 2001-2003 we evaluated the use of *in situ* oxidative strategies to be used in combination with pump-and-treat and MNA to reach the groundwater cleanup levels set forth in the 1992 ROD.

EPA first tested the use of an oxygen-releasing compound (ORC™) in parts of the northern and southern groundwater contaminant plumes as an alternate cleanup method for the VOCs in the plumes. The use of the ORC™ method involves the injection of the ORC™ material into the contaminated aquifer whereby the ORC™ material slowly releases oxygen to the strata, allowing naturally-occurring aerobic bacteria to metabolize and destroy the VOC-contaminants. The ORC™ cleanup results were inconclusive, so we tested another *in situ* oxidative method at the site - a modified Fenton's Reagent consisting of hydrogen peroxide, iron sulfate, and proprietary binders and catalysts. The modified Fenton's Reagent works by chemically destroying the VOCs it comes into contact with.

In April 2004 we injected a test application of the modified Fenton's Reagent into the ground along the southern boundary of the barrier wall (see Figure 2). This area of the site contains a hydrocarbon "smear zone" we discovered through our ORC™ testing efforts that is a continual source of VOC contamination to the groundwater aquifer just below it. Results of the modified Fenton's Reagent test were very satisfactory and we've decided to incorporate its use into the overall site cleanup strategy.

IV. Description of Significant Differences

EPA will now use a combination of active restoration methods, such as groundwater pump-and-treat and an *in-situ* oxidative strategy, and MNA to achieve the 1992 ROD groundwater cleanup levels in the off-site contaminant plumes. This groundwater cleanup strategy replaces the groundwater pump-and-treat cleanup method we selected in the 1992 ROD. In the southern plume area we will inject the modified Fenton's Reagent into the hydrocarbon "smear zone" to destroy the source of the VOCs in the contaminant plume. After we complete the chemical oxidant application we will

use MNA to demonstrate and track the restoration of groundwater quality in the southern plume. We do not anticipate using groundwater pump-and-treat in this area.

We estimate that we will be applying between three to four doses of the modified Fenton's Reagent into the "smear zone" to destroy the source of the southern area contaminant plume during the September 2004-December 2005 time period. Afterwards we will monitor groundwater quality in the plume area to demonstrate that natural attenuation forces are reducing contaminant levels to the 1992 ROD cleanup levels. We may use computer modeling to evaluate the effectiveness of the MNA approach a year or two after groundwater monitoring begins.

The cost of applying the modified Fenton's Reagent is estimated to be $1,000,000, which is not a significant change to the overall cost of the groundwater cleanup action. The costs of monitoring groundwater quality during the MNA period are likely to be comparable to the estimated groundwater monitoring costs in the 1992 ROD.

We will continue to use the groundwater pump-and-treat strategy in the northern contaminant plume area because this method continues to be the most effective way to restore groundwater quality in this area. We will also continue to use the groundwater pump-and-treat method to create and maintain an inward gradient across the barrier wall as a part of the on-site containment remedy.

V. Support Agency Comments

None.

VI. Statutory Determinations

EPA has determined that with the change we have made to the ROD groundwater cleanup method in this ESD, in accordance with CERCLA Section 121, the selected remedial action for the ACS site is protective of human health and the environment. It also complies with federal and state requirements that are applicable or relevant and appropriate, uses permanent solutions to the maximum extent practicable, and is cost-effective.

VII. Public Participation Compliance

EPA shall publish a notice of availability and a brief description of this ESD in the local newspaper as required by NCP 300.435(c)(2)(i)(B). We will also place this ESD into the Administrative Record file and information repository located at the Griffith Library as required by NCP 300.435.(c)(2)(i)(A).

VIII. Declaration

EPA has determined that the adjustments to the ACS site ROD provided in this ESD are significant but do not fundamentally alter the overall site remedial action with respect to scope, performance, or cost. I therefore approve the issuance of this ESD for the ACS site and the changes to the groundwater remedial action stated herein.

Richard C Karl

Richard C. Karl, Acting Director
Superfund Division
U.S. EPA Region 5

9-15-04

Date

Figures

American Chemical Service, Inc. Site
Griffith, IN

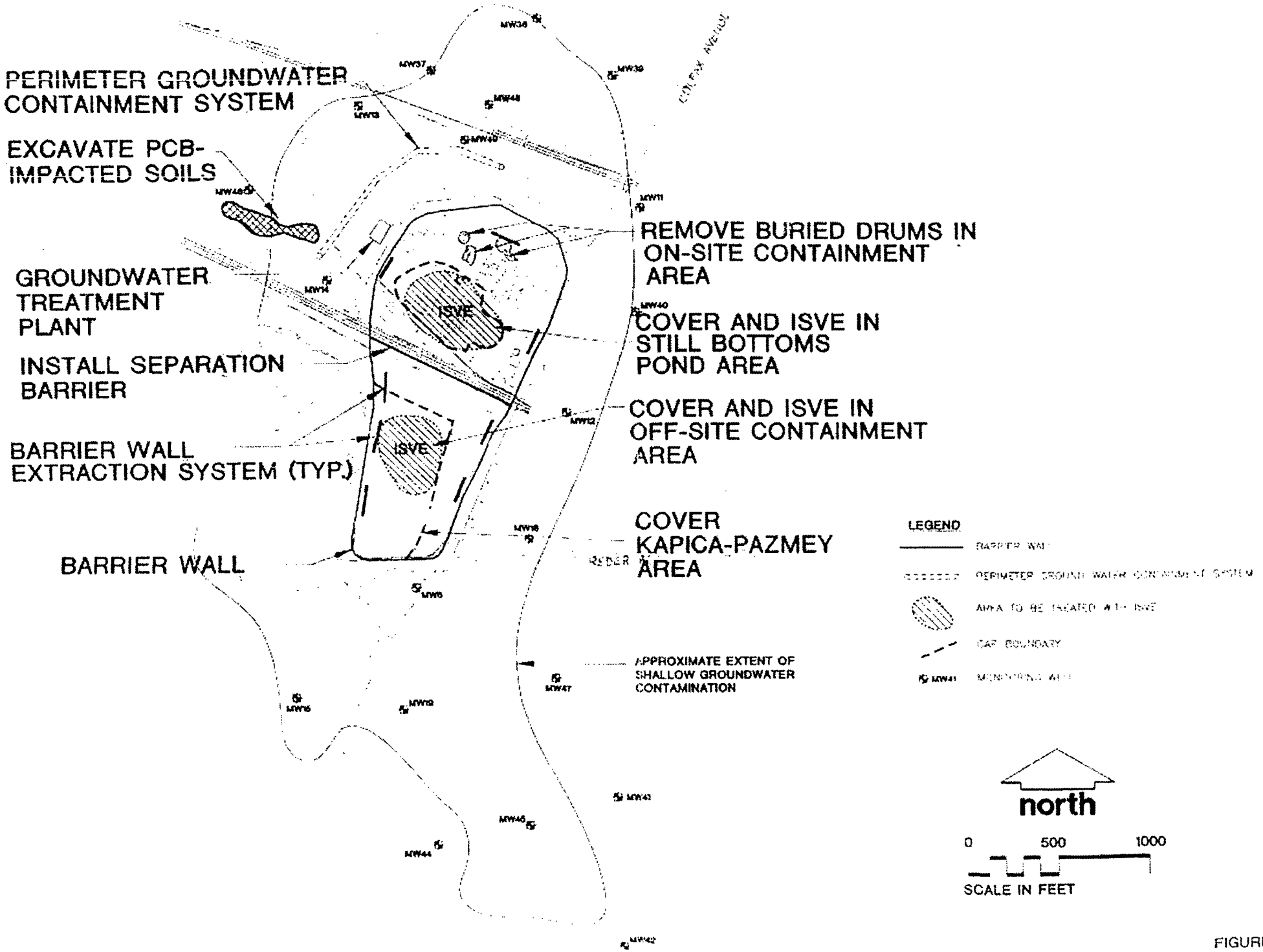
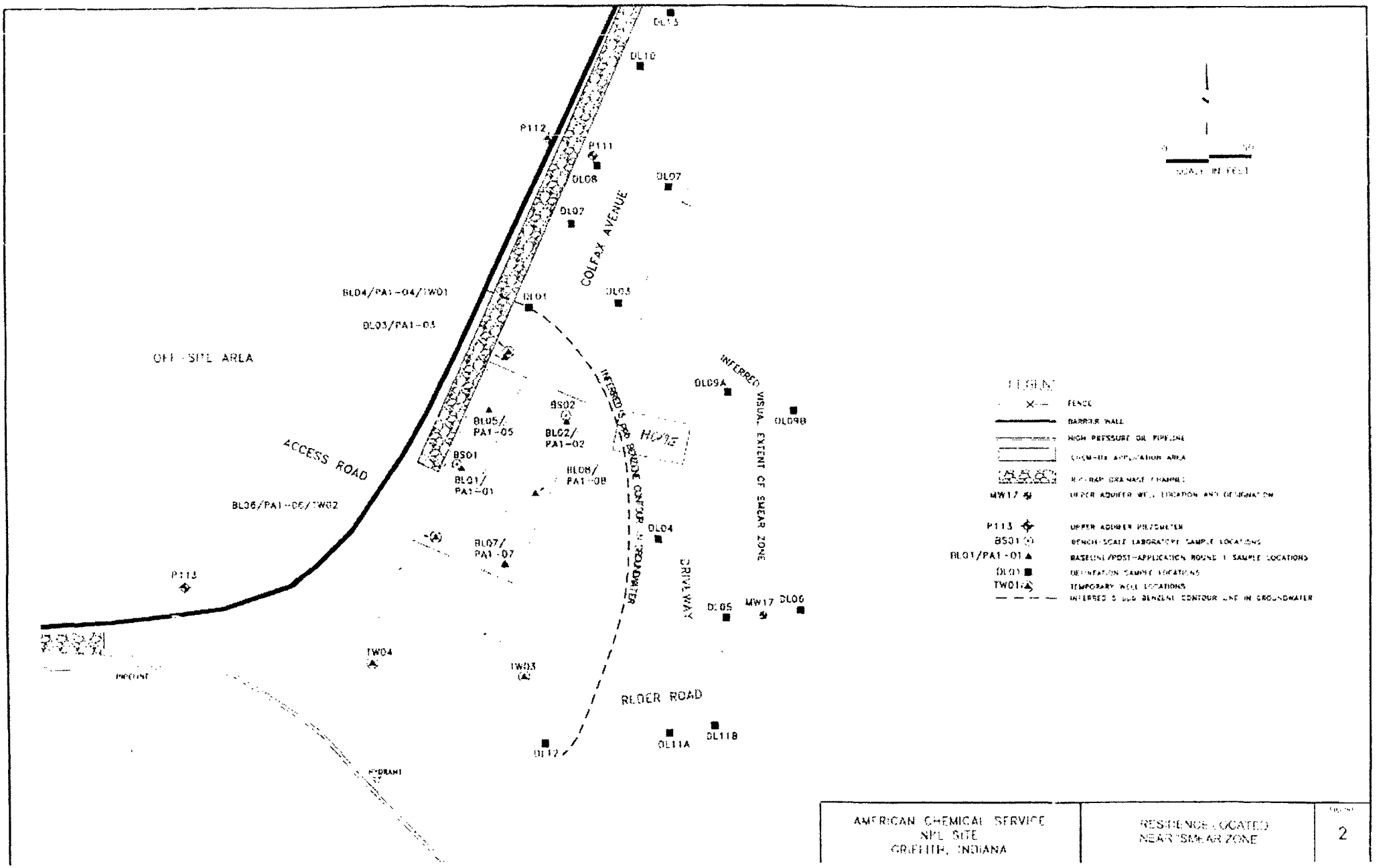

PERIMETER GROUNDWATER CONTAINMENT SYSTEM
EXCAVATE PCB-IMPACTED SOILS
GROUNDWATER TREATMENT PLANT
INSTALL SEPARATION BARRIER
BARRIER WALL EXTRACTION SYSTEM (TYP.)
BARRIER WALL
REMOVE BURIED DRUMS IN ON-SITE CONTAINMENT AREA
COVER AND ISVE IN STILL BOTTOMS POND AREA
COVER AND ISVE IN OFF-SITE CONTAINMENT AREA
COVER KAPICA-PAZMEY AREA
APPROXIMATE EXTENT OF SHALLOW GROUNDWATER CONTAMINATION
ISVE
ISVE
LEGEND
north
0
500
1000
SCALE IN FEET

FIGURE 1



AMERICAN CHEMICAL SERVICE NPL SITE GRIFFITH, INDIANA	RESIDENCE LOCATED NEAR SMEAR ZONE	2

Table 1

Components of the Selected Remedial Action

American Chemical Service, Inc. Site
Griffith, IN

Table 1 - Components of the Selected Remedial Action
ACS Site, Griffith, IN

1992 Record of Decision	1999 ROD Amendment	2004 ESD
Excavate buried wastes and contaminated soil and debris. Treat organic contaminants on site using low-temperature thermal desorption on soil and use other methods, such as steam-cleaning, on the debris. Metals-containing residuals may require a further immobilization step.	Construct a subsurface barrier wall ("slurry wall") around the ACS site to minimize the movement of site contaminants off site and to impede groundwater flow into the site.	No further changes.
Dispose of miscellaneous debris off site.	Place a soil cap over contaminant source areas to reduce the infiltration of rainwater and snowmelt into the area enclosed by the slurry wall and to prevent direct contact of site contaminants.	No further changes.
Construct a groundwater pump-and-treat system capable of dewatering the site and also containing the off-site groundwater contaminant plume(s). Discharge treated water into the wetlands.	Pump groundwater from within the area surrounded by the slurry wall to maintain an inward groundwater gradient across the wall. Construct a groundwater pump-and-treat system to contain the northern and southern off-site groundwater contaminant plume(s). Discharge treated water into the wetlands.	Use a modified Fenton's Reagent to chemically destroy the source of VOC contaminants in the southern plume area and then use MNA to demonstrate the cleanup of this plume.

Table 1 - Components of the Selected Remedial Action
ACS Site, Griffith, IN

1992 Record of Decision	1999 ROD Amendment	2004 ESD
Excavate approximately 400 buried 55-gallon chemical storage drums from the On-site Containment Area and ship them off site for incineration of the contents.	Excavate approximately 400 buried 55-gallon chemical storage drums from the On-site Containment Area and ship them off site for incineration of the contents.	No further changes.
Perform a monitoring program in the adjacent wetlands and clean them up if necessary.	Excavate PCB-impacted wetland sediment to a cleanup level of 1 ppm. Dispose of PCB-impacted sediment containing 50 ppm or more in an off-site TSCA compliant facility. Dispose of PCB-impacted sediment containing less than 50 ppm underneath the on-site soil cap.	No further changes.
Perform a pilot scale test of *in situ* soil vapor extraction (ISVE) in the On-Site Containment Area and then implement a full scale ISVE system to clean up VOCs in this area.	Perform ISVE in the On-Site Containment Area, the Kapica-Pazmey Area, and the Off-Site Containment Area to clean up VOCs in these areas.	No further changes.
Implement a long term groundwater monitoring program that includes private well sampling. Impacted wells could be subject to closure or the owner would receive groundwater-use advisories from EPA or the state.	Implement a long-term groundwater monitoring program that includes private well sampling. Impacted wells could be subject to closure or the owner would receive groundwater-use advisories from EPA or the state.	No further changes.

Table 1 - Components of the Selected Remedial Action
ACS Site, Griffith, IN

1992 Record of Decision	1999 ROD Amendment	2004 ESD
Erect a security fence around the site to prevent access. Place institutional controls on the property.	Erect a security fence around the site to prevent access. Place institutional controls such as deed notices and site-use restrictions on the property. The site-use restrictions would ensure that the future use of the property will be restricted to those activities which do not interfere with the performance of any of the cleanup activities. The deed notice would serve to warn future site owners that should a zoning change be made, such a change must be accompanied by a proper cleanup effort needed for the new site-use assumption.	No further changes.

Appendix 1

Institutional Controls for the American Chemical Service, Inc. Site

Griffith, IN

Institutional Controls for the American Chemical Service, Inc. Site
Griffith, IN

EPA and about 40 ACS PRPs entered into a cleanup consent decree in January 2001. Paragraph 38 of the consent decree noted that:

> "Owner-Settling Defendants have previously recorded deed restrictions which preclude residential development at the Site, use of ground water for potable purposes, and any interference with the final remedial action. Owner-Settling Defendants shall maintain these previously recorded deed restrictions as already imposed, until such time as EPA determines that they are no longer necessary. Commencing on the date of lodging of this Consent Decree, Owner-Settling Defendants shall refrain from using the Site, or such other property, in any manner that would interfere with or adversely effect the integrity or protectiveness of the remedial measures to be implemented pursuant to this Consent Decree. Nothing herein is intended to modify or eliminate Owner-Settling Defendant's pre-existing obligations with respect to these deed restrictions. If EPA determines that land/water use restriction in the form of state or local laws, regulations, ordinances or other governmental controls are needed to implement the remedy selected in the ROD and /or amended ROD, ensure the integrity and protectiveness thereof, or ensure non-interference therewith, Settling Defendants shall cooperate with EPA's and the State's efforts to secure such governmental controls."

Owner-Settling Defendant in this case is American Chemical Service, Inc.

Later, CSX Transportation, Inc., an adjacent landowner and Settling Defendant in the cleanup consent decree, recorded a deed notice to successors-in-title on its property in accordance with the consent decree. The notice was placed so that any future owner of the non-ACS-owned parcel will know that there is a cleanup consent decree entered into by the EPA and the ACS PRP group and that future site uses will be restricted to those activities which do not interfere with the performance of any cleanup activities listed in the 1992 ROD and 1999 ROD Amendment. The deed notice can only be removed from the property with EPA concurrence.

Lastly, the consent decree requires the ACS PRP group to timely comply with an EPA request to place other institutional controls on cleanup site area property as necessary so that the property owner(s) shall

> "refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures to be implemented pursuant to this Consent Decree."

Thus, all necessary institutional controls have been placed on the ACS site as appropriate and the consent decree provides EPA with a mechanism to apply further controls if we request them.